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Rediscovery, distribution and taxonomic description of *Astragalus trichocarpus* Benth. (Fabaceae) from the Northwestern Himalayas - Kashmir, India

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ABSTRACT

Astragalus trichocarpus Benth. (Fabaceae) was first scientifically described by Graham & Benth in 1835 from the Indian Himalayas. From the time of its description, a number of reports were published from the Indian subcontinent, however no such description of this species was reported from the Kashmir Valley, India for the last 68 years. In the present study, the nomenclature, botanical description, photographs of diagnostic characters and distribution of the species have been provided to substantiate the rediscovery of this species from the Kashmir Himalayas, India.

Keywords: *Astragalus trichocarpus,* Rediscovery, Description, Himalaya, Kashmir, India.

1. INTRODUCTION

Universally, the Genus *Astragalus* Linnaeus (Fabaceae) is considered the largest genus in Angiosperms comprising of over 3,000 species. It is distributed throughout the temperate regions of Europe, Asia And North America, primarily in cold arid and semi-arid mountainous regions of the Northern hemisphere and South America. Apart from its presence in the Irano-Turkish region of South-Western Asia, the genus is most variegated in The Sino-Himalayan Plateau of South-Central Asia and The Great Basin and Colorado Plateau of Western North America (Polhill, 1981; Podlech, 1986, 1998; Zarre & Podlech, 1997; Lock & Schrire, 2005). It was Baker (1876), who reported and described the first systematic account of Indian *Astragalus* more than 100 years ago in the '*Flora of British India*' by Hooker and about 50 species from present India were recorded (Chaudhary & Srivastava, 2007).

During floristic explorations in the Kashmir Himalayas, a few specimens belonging to different families were collected in the Sangar, Khunmoh area of

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District Srinagar Kashmir (Fig. 1). Based on a critical study of the specimens and expert opinions received. Among the collected species, the specimen *Astragalus trichocarpus* was rediscovered from the Northwestern Himalayas, Kashmir valley, India. Hence, it is reported here as a rediscovery to the flora of Kashmir, India. A brief description along with photographs are provided to facilitate easy identification of this taxon.

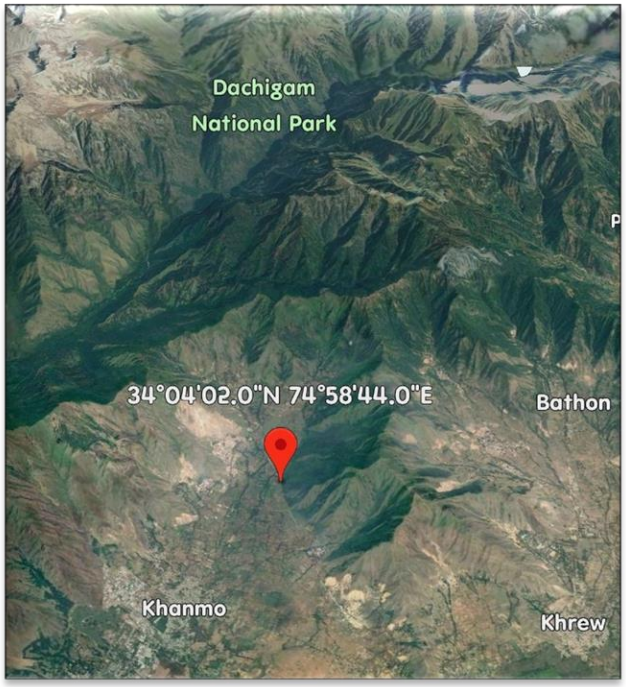

Figure 1. Map of the collection site (Google Earth, 2022)

2. TAXONOMIC TREATMENT

Astragalus trichocarpus Grah. (in Wall., Cat. 5296. 1831-32, nom. nud) ex Benth. in Royle, Illust. Bot. Himal. 199. 1835; Baker in Hook. f., Fl. Brit. India 2: 121. 1876; Ali in Biologia 7: 71. 1961 & in Nasir & Ali, Fl. W. Pakistan 100: 202, f. 27 A - E. 1977; Wenninger in Mitt. Bot. Staatss. Munchen 30: 88, f. 8 d-e, 23 c, 27 d-f. 1991; Sanjappa, Legum. India 96. 1992; Kumar & Sane, Legum. South Asia: Checkl. 243. 2003.

Astragalus sesbanioides Royle ex Benth. In Royle, Illust. Bot. Himal. 199. 1835.
Tragacantha trichocarpa (Benth.) O. Kuntze in Revis. Gen. 2: 948. 1891.

Astragalus trichocarpus Benth is a perennial Herbaceous erect plant up to 4-5 feet Tall with 3-5 cm in circumference and 1-1.5 cm in diameter. The stem is Dark greenish, monopodial branching with marked grooves from top to bottom. The leaf shape is oblong blunt which is an imparipinnate compound with 20-41 leaflets, each leaflet size is 5-10 mm. The rachis is 10-12 cm long. Leaf venation is reticulate. The adaxial surface of the leaf is light green whereas the Abaxial surface is Dark green, velvety, Pubescent, Silvery with minute hairs. Stipules are minute. The inflorescence is Pedunculate raceme 8-20 cm long, whorl bears light pinkish flowers, Young flower buds are dark pink Bract is linear and minute, Floral stalk or Peduncle is short, velvety, Pubescent light black and whitish in colour, Flower is Papilionaceous type with Vexillum, keel and wing are clearly seen. Vexillum is a Standard petal of 8-12 mm long, Keel is 5-7 mm long, the wing is 3-4 mm long however wing is shorter than the keel. The calyx is glabrous, Deltoid, Teeth like triangular at the top, Aestivation is vexillary, Stamens are diadelphous, Carpel is single, Anthers yellowish with long filament enclosed inside boat shaped flower. The sepal tube is 2-3 mm long hairless. Seed is Bilocular, Stipe longer than Calyx. (Fig. 2)

Flowering Period: April to June.

Habitat: *Astragalus trichocarpus* Benth grows on sloppy Mountains in Kashmir Valley.

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***Specimen examined*:** INDIA, Jammu and Kashmir, Srinagar district, near Sanger Khunmoh, N 34°04'02" E 74°58'44", 5000 m, 14.05.2021, *Umar & Shakir* 111 (KMR).

***Distribution*: India:** Himachal Pradesh (Chowdhery & Wadhwa, 1984), Uttarakhand (Baker, 1886; Blatter, 1928), Jammu and Kashmir UT (Baker, 1886; Blatter, 1928).

From India, only Wenninger (1991) has recorded this species. He has described one another subspecies *A. trichocarpus* ssp. pseudo-hofmeisteri (Sirj. & Rech. f.) Wenninger from Afghanistan and Pakistan.

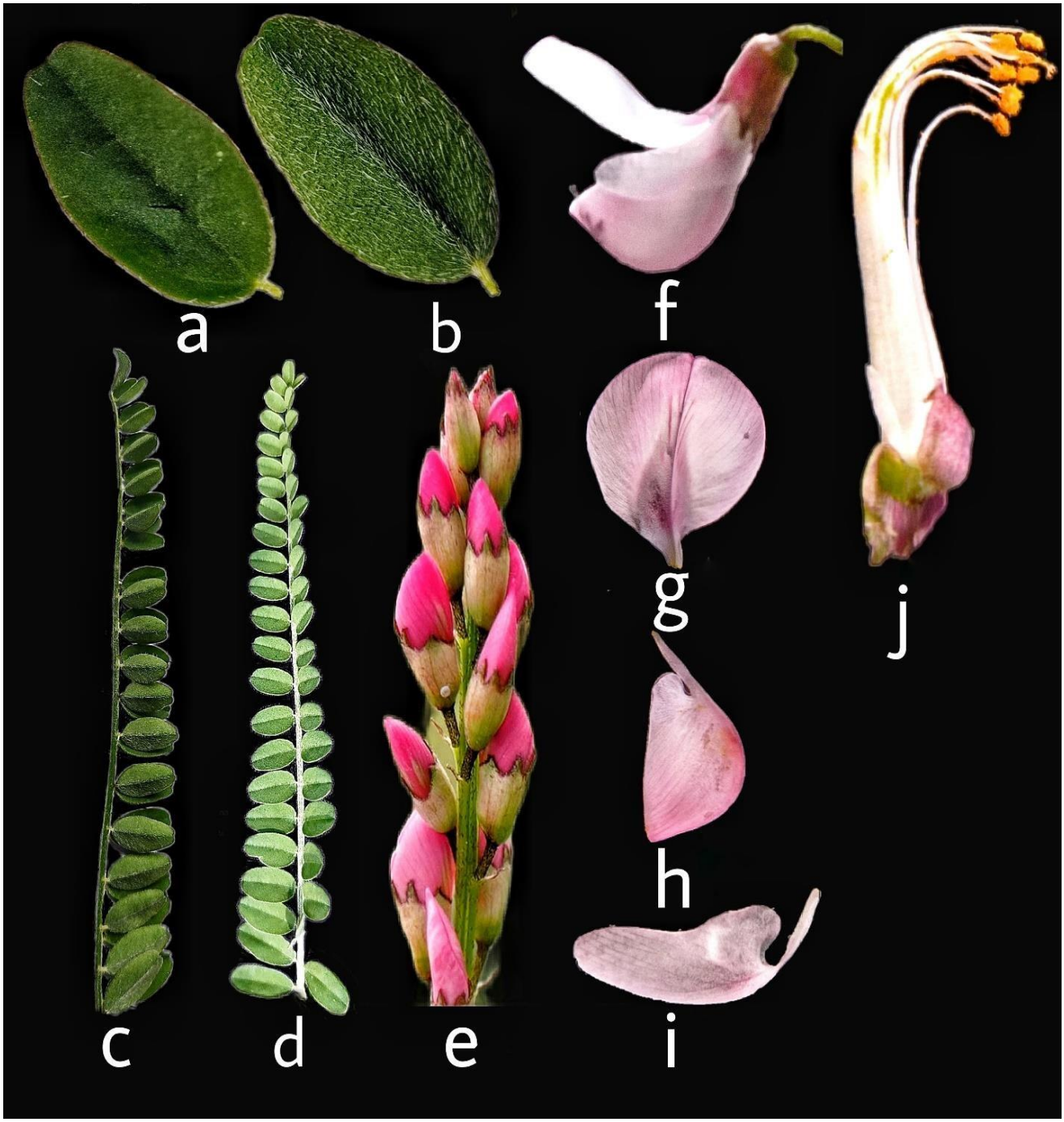

Figure 2. *Astragalus trichocarpus* Benth. **a-d.** Upper and lower surface of leaf; **e.** Young flower buds; **f.** Flower; **g.** Vexillum; h. keel; **i.** wing; **j.** Stamen and carpel.

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3. CONCLUSION

North-western Himalayas, mainly the Kashmir region is one of the major biodiversity hotspots of India. The region is rich in both flora and fauna and the revision of the flora in the region has been well documented in the recent past aided by some old checklists from British India and authors of the different parts of India as well. The loss of the plant species has negative implications for both humankind and natural ecosystems (Riyaz et al., 2021). A high elevation is been observed in endangerment and extinction of both flora and fauna in the present millennium and the introduction of species is contributing a major threat to biodiversity. With these short notes and mini-revisions of the plant species, many young researchers will come forward to travel around the unexplored areas of the Kashmir Himalayas as new many species await discovery.

Acknowledgement

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Ethical approval

Astragalus trichocarpus Benth. (Fabaceae) from the Northwestern Himalayas - Kashmir, India is reported in the study. The ethical guidelines for plants & plant materials are followed in the study for sample collection & identification.

Funding

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Conflicts of interests

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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